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10/520,366	01/06/2005	Manfred Danziger	0306670-US	5933

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P O Box 381516
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EXAMINER

DAHIMENE, MAHMOUD

ART UNIT	PAPER NUMBER
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1765

MAIL DATE	DELIVERY MODE
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06/29/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/520,366

Applicant(s)

DANZIGER, MANFRED

Examiner

Mahmoud Dahimene

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 April 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 20-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 20-39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date: _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The amendment filed 4/16/2007 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

line 32: cancel "bonding"; page 3, line 1' after "intermediate" insert-bonding-; line 8: after "processes" insert-being connected to the surface at increased strength-; line 10: change "foil" to -film-; line 13: cancel "under the effect of" and change "on" to -affecting-; line 14: change "foil" (first occurrence) to-film dissolves-, change "foil" (second occurrence)" to -film- and cancel "is dissolved-; line 15: change "of" to-between-; line 20: change "foils" to -films-; line 23: change "foil" to -film-; line 24: change "the" (Grst occurrence) to -a-; line 26: after "metal," insert -whereas-, after "surface" insert -is- and cancel "being"; line 31: change "foils" to -films-; page 4, line 1 ; after "the" (first occurrence) insert -strength of the-, change "strength the" to -between a- and "foils" to -films-, ; line 8: change "fixing" to -guide- and -foils- to -films-; line 9: after "direction" insert -of-; line 13: change "foil" to-film-; line 15: change "beginnings" to -approach to-; line 16: change "of an irradiation of" to-irradiating" and "foils" to -films-; line 20: change "with" to \pm wherein- and cancel "generated";,; page 4,,; page 5, line 1 : cancel "the application and sufficiently strong and lasting"; line 2: change "connection strength of useful layers" to--applying layers connected to a substrate with sufficient strength and durability-; line 3: change "an adhesion" to connection; line 4: change "adhering" to -

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connected-; line 5: after "mechanical" insert -stresses- and after "conditions" insert line 7: change "which" to -to-, cancel "connection" and change "of" to -at which- and after "layers" insert -adhere to their substrate-; line 8: after "conditions" insert-,-; line 9: change "foils" to -films-; change "foils" to -films-; line 16: change "foil" to -film-; between lines 16 and 17: lines 19 to 21: cancel and substitute therefor -bombardment of a solid material carrier film by high energy heavy ion irradiation at two different angles and under special controlled conditions, hereafter to be described, so as initially to form in the carrier film intersecting ion traces which by subsequent chemical etching form intersecting channels below the surface of the carrier film for securely anchoring a metal layer precipitated on the surface of the carrier layer. Other objects will in part be obvious and will in part appear hereinafter.-; line 25: change "foil. This allows formation of" to -film. In this manner-; line 26: after "struc(ure" insert -.can be formed", change "makes a subsequent adhering" to -results in a strongly connected- and cancel "possible"; page 5, line 29: change "from" to -by way of- and "The" to -By varying the bombardment energy, the-; line 31 : cancel "by varying the bombardment energy"; line 32: after in" insert --reliefs of-- and cancel "reliefs"; page 6, line 1: change "Surface depth relief" to -Reliefs of varying surface depth"; line 2: change "of" (first occurrence) to -in-; line 5,: change "of" to -at-; line 6: change "attains" to -attaining-; line 13: change "adhesion" to -connection-; line 15: after "not" insert -solely-; line 16: cancel "only"; lasting line recesses"; line of forming line line 21: cancel "lasting connection" and after "strength" insert -of a connection-; 22: change "generating" to -forming recesses with-; and cancel "of 25: change "a precondition of this method in this" to -the method such intersecting recesses

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is also preconditioned on-; 26: cancel "case as well, is"; line 30: change "generating" to -forming-; page 7, line 16: change "high values of connection strength" to -strong connections--; line 18: change "has been" to -will be-; line 19: after "the" insert -described- and cancel "which has already be-; line 20: cancel "described": line 25: cancel "a"; line 26: change "case" to -circumstances- and cancel "which is"; line 27: change: ahead" to -above-; line 28: cancel "of" (first occurrence); line 29: cancel "which is"; line 30: change "value" to -power-; line 31: change "foil" to -film-; line 32: change "foils" to -films-; page 8, line 2: change "ahead of" to -above- and "in front of" to -facing-; line 3: cancel "energy which"; line 4: change "has to be less" to -power to a level lower- and "after leaving" to -.emitted by--; line 5: change "by" to -when- and "losing" to -lose-; line 8: change "generated" to -established-; line 11 : change "for the realiT_ation" and after "of" insert -practicing-; line 17: change "intersection" to -intersections-; line 21: change "will be" to -is-; line 25: change "solution" to -model-; line 31: after "of" (second occurrence) insert -the- and after "to" insert -the-; line 32: after "of" insert -the-; page 9, line 2: cancel "it"; line 4: change "guarantee" to -ensure- and after "lasting" insert --and--; line 5: cancel: "strength"; line 9: change "high values of connection" to -and strong connections between substrate and coating-; line 10: cancel '~strength", after "they" insert -are in- and after "contact" insert -with-; line 11 : after "or" insert -exposed to--; line 16: change "for" to -of-; line 17: change "foil" (both occurrences) to -film-; line 19: change "foil" to -film-; line 24: change "an upstream" to -a-- and after "module" insert -disposed above it-; line 25: after "energy" insert -. -, after "and" insert -it-, after "a" insert -a roller dispensing the film at the beginning of the processing path, line 26: change "foil" to -

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film- and "fixing" to -guide-; line 27: change "feed" to -the dispensing-; line 28: after "and" insert-a" and change "rollers" (second occurrence) to -roller-; line 29: change "fixing" to -guide-; line 30; change "onto" to -relative to- and "foil" to -film-; page 10, line 3: change "of partial components" to -from component parts-; line 9: change "is" to -can be-; lines 12 to 17: line 20: change "foils" to -films-; line 25: cancel "of such": line 26: change "composite components as an", to -between the-change "foil" to -film- and after "copper" insert -components of the composite,-; line 27: change "pore" to -the- and after "the" insert -pores in the-and change "foil" to -film-; line 30: change "foil" to -film-; page 11, line 2: change "foil" to -film-; line 5: change "foils" to -films- and "foil" to -film-; line 7: after "to" insert -the-: line 14: change "foils" to -films-; line 17: change "foil" to -film-; line 19: change "foil" to -film-; line 30: change "an" to -a-; line 31 : change "foils" to -films-; line 32: change "pore" to -the-, after "of" insert -the pores in-, change "foil" to -film- and after "test" insert ---or stripping-; page 12, line 7: change "is" to -holds-; line 8: after "hence" insert -of-; line 12: change "one may observe a reduction of" to -the- and after "strength" insert-is reduced-: line 15: change "foil" to -film-; line 18: change "depending upon" to -relative to-; line 22: change "foil" to -film-; line 23: change "foil" to -film-; line 25: change "application" to -use- and "foil" to -film-; line 26: change "foil" to -film-; line 29: change "foil" to -film-; page 13, line 1: change "Upstream of" to -Above-; line 5: change "ahead of" to -above-; line 7: change "foil" to -film-; line 9: change "foil" to -film- and "followings it" to -following its-; line 10: change "fixing" (both occurrences) to -guide-; line 11 : change "fixing" to -guide-; line 28: change "foils" to -films-; page 14, line 1: change "foil" to -film-; line 8: change "foil" to -film-; line 14: change "foil" to -film-; line 17:

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change "foil" to -film-; line 22: change "foil" to -film-; line 27: change "foil" to -film-; page 15, line 7: change "strong" to -significant-; line 8: change "foil" to -film-; line 10: change "foil" to -film-; line 14: change "foil" to -film-; line 17: change "foils" to -films-; line 21 : change "foils" to -films-;

All of the above do introduce new matter into the disclosure of the invention
Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 20-23, 28-38, are rejected under 35 U.S.C. 103(a) as being unpatentable over Gliem et al. (US 4,364,792) in view of Hatakeyama et al. (US 6,015,976).

Regarding claim 20-23, 28-31, Gliem Describes a process for roughening a surface (possibly of a carrier material) of synthetic resins including polyimides, near the surface (column 2, line 11), for improved adhesion by exposing the region of the surface to be coated before the etching process to a heavy ion irradiation (column 1, line 60). "Through this there is produced in the molecules near the surface changes which in a subsequent etching process lead to the formation of exactly defined depressions (cavities) in the surface according to the side, shape and number. By means of this defined surface roughening the adhesiveness of the layers to be metallized is

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substantially improved. The number, the size and the shape of the depression can be regulated through the choice of the heavy ion radiation, the duration, the intensity (influx) and the angle of incidence of the radiation and by the subsequent etching process (using NaOH (claim 7))" (column 7, line 60). Gliem discloses "Preferably the process of the invention is used for the copper plating of polyimide films, polycarbonates, polyester films and epoxide resin films and sheets" (column 2, line 30), and "As energy rich radiation there is advantageously used a heavy ion radiation with particles having a mass of greater than 10 and whose energy is greater than 0.1 meV per nucleon". The duration of irradiation thereby can vary between seconds and hours depending on the type of the radiation and the desired "aperture number". The number of heavy ions per unit of surface is decisive in this case" (column 2, line 37).

The ions of Gliem must generate within the material a plurality of latent ion traces extending into the material to a predetermined depth and at a predetermined influx angle since only the irradiated material is affected by the subsequent etch.

It is noted that Gliem does not expressly recite irradiating the surface at predetermined influx angles by at least one beam of high energy heavy ions of predetermined density and energy dissipation to generate within the carrier material a first plurality of latent ion traces extending into the carrier material to a predetermined depth and at a predetermined influx angle and a second plurality of latent ion traces substantially similar to and intersecting the latent ion traces of the first plurality; and subjecting the ion traces of the first and second plurality to a chemical etching process for forming recesses extending from the surface to within the carrier material at an

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aspect ratio of A from about >3 to about 4 and whereby two or more of such recesses intersect below the surface to form common chambers.

The reference of Hatakeyama et al. teaches an apparatus and method for fabrication employing collimated energy beams including ion beams. Hatakeyama teaches the concept of irradiation being carried out such that the influx of a bundle of rays of high-energy heavy onto a substrate surface (2) takes place under at least two different angles (figures 73 and 117) (forming frusto-conical shapes when mask openings are large enough to produce intersection of the radiating beams), the trajectories can easily be controlled to result in intersections which are generated each of which connects two recesses with each other to an united volume unit and the intersections of which are to be found in areas of the recesses in the interior of the substrate. It is noted that in the method of Hatakeyama the etching is performed by the energetic beam, however, Hatakeyama teaches the concept of using two ion beams at different angles, and the intersecting ion beams are used to define complex shapes in the material.

Therefor, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Gliem to include the etch feature defining method of Hatakeyama because Hatakeyama teaches how ion beam angle, energy, flux and duration can be used along with masking techniques to obtain practically any shaped features on a substrate.

One of ordinary skill in the art would have been motivated to modify the method of Gliem with the etch feature defining method of Hatakeyama in order to further define

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the roughened surface with localized cavities in order to further improve adhesion by allowing the adhesive to be "anchored" in the etched micro-cavities.

Gliem teaches The number, the size and the shape of the depression can be regulated through the choice of the heavy ion radiation, the duration, the intensity (influx) and the angle of incidence of the radiation and by the subsequent etching process" (column 7, line 60).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Gliem to form recesses extending from the surface to within the material at any aspect ratio including an aspect ratio of A from about >3 to about 4 and whereby two or more of such recesses intersect below the surface to form common chambers because Gliem teaches how to control size and shape of the depressions and Hatakeyama teaches how to define intersecting cavities with more than one ion beam.

As to claims 32-38, it is noted that Gliem is silent about the ion species including argon and krypton, density and energy as well as the size of the depression, however, Gliem teaches The number, the size and the shape of the depression can be regulated through the choice of the heavy ion radiation, the duration, the intensity (influx) and the angle of incidence of the radiation and by the subsequent etching process" (column 7, line 60). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Gliem to tune the ion source to include argon or krypton at a desired level, density and energy to produce the desirable depressions, since it has been held that where the general conditions of a claim are

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disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

Claim Rejections - 35 USC § 103

3. Claims 24-27, 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gliem et al. (US 4,364,792) and Hatakeyama et al. (US 6,015,976) as applied to claims 20 above, and further in view of Koh et al. (US 2002/0014597) and Clements (US 5,449,917), Aston (US 4,447,773) and D'Amato (US 6,440,277).

It is noted that Gliem is silent about a roller system for processing a foil or film.

The reference of Koh teach that methods of positioning rollers in a vacuum system in order to accomplish desired exposure of a film or foil to energetic ion beams are conventionally used in film processing (figure 5).

Aston describes an ion accelerator module used for material processing, the module includes an ion decelerator plate, which is positioned between the accelerator and the workpiece or mask (column 4, line 4).

Clements teaches a roller-driven multi-pass system for processing a film with an energetic beam (abstract).

D'Amato teaches an inverted V-shaped roller system for treatment of a substrate (figure 6, sputtering section (26)).

It is noted that neither Koh, Clements or D'Amato teach the exact system as described by applicant's claim 24-27, however, the combined teachings of Koh and

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Clements and D'Amato describe that proper positioning of rollers can expose a film to ion radiation in any desired manner including a V-shaped configuration.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Gliem to include, in the system for processing carrier material with heavy ions, a roller system as described in applicant's claims 24-27, because positioning rollers in vacuum for film surface processing is conventionally known in the art of film surface processing, as suggested by Koh, Clements and D'Amato. One of ordinary skill in the art would have been motivated to use a mask to protect parts of the system that do not need to be exposed, and rollers to expose the film under desired angle or angles in order to achieve at least the dual angle exposure recommended by Gliem and Hatakeyama using one single ion source, and at least a dual-pass system as suggested by Clements. The applicant did not show any unexpected results in using a treatment roller configuration conventionally used in surface treatment applications.

Response to Arguments

4. Applicant's arguments with respect to claims 11-19 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mahmoud Dahimene whose telephone number is (571) 272-2410. The examiner can normally be reached on week days from 8:00 AM. to 5:00 PM..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



MD.

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SPE - 1765
SUPERVISORY PATENT EXAMINER
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